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(54) Drying cloth lengths

(57) Apparatus for the continuous heat treatment, especially drying, of runs of cloth such as lengths of woven fabric, lengths of knitted fabric, lengths of bonded fabric or the like, which are liable to shrinkage during the treatment and are placed with overfeed on to an endless wire cloth running through the drier and to which the treatment agent is supplied from above and below alternately through nozzles set in nozzle heads and provided above and below the run of

cloth, is characterised in that rotary slide valves (18, 19) producing opening and closing areas are arranged in front of the admission of the treatment agent into the nozzle heads (13, 14) and through which alternately the passage of the treatment agent to the upper nozzle head and to the lower nozzle is opened or shut off. The closing areas of the rotary slide valves (18, 19) may be greater than the opening areas and partially overlap one another. Packing strips (22) may be provided between the stationary drier casing and the rotary slide valves (18, 19), and may be adjustable. The rotary slide valves (18, 19) are preferably driven by means of a chain drive (24, 25, 26) by way of variable speed gearing (23).

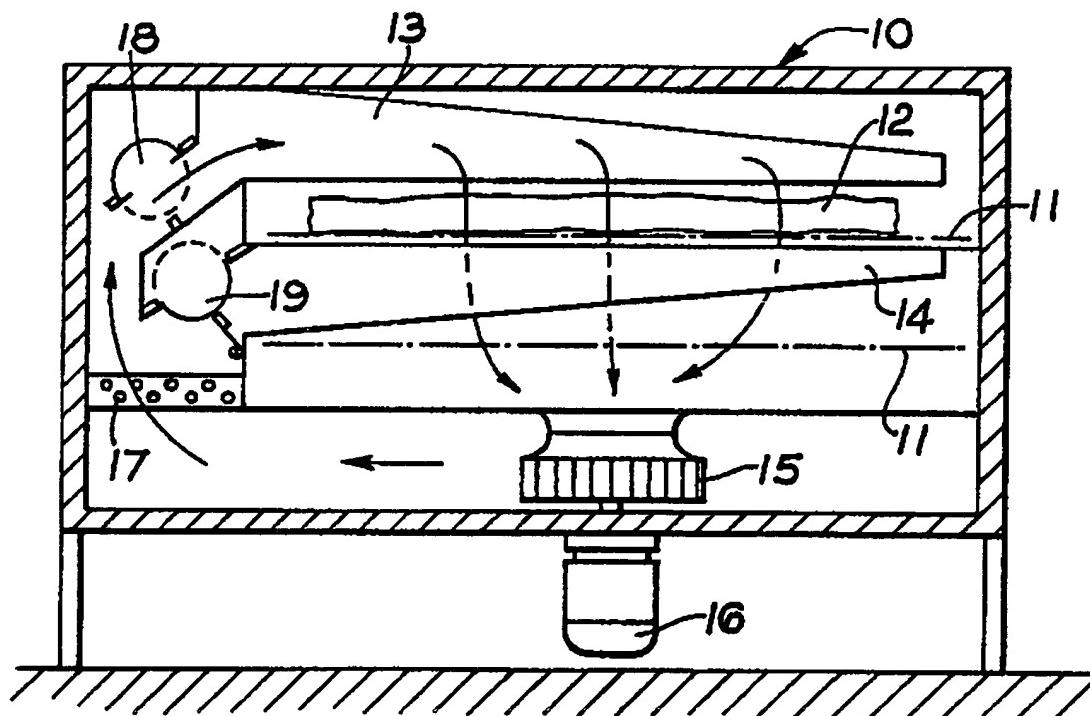


Fig. 1

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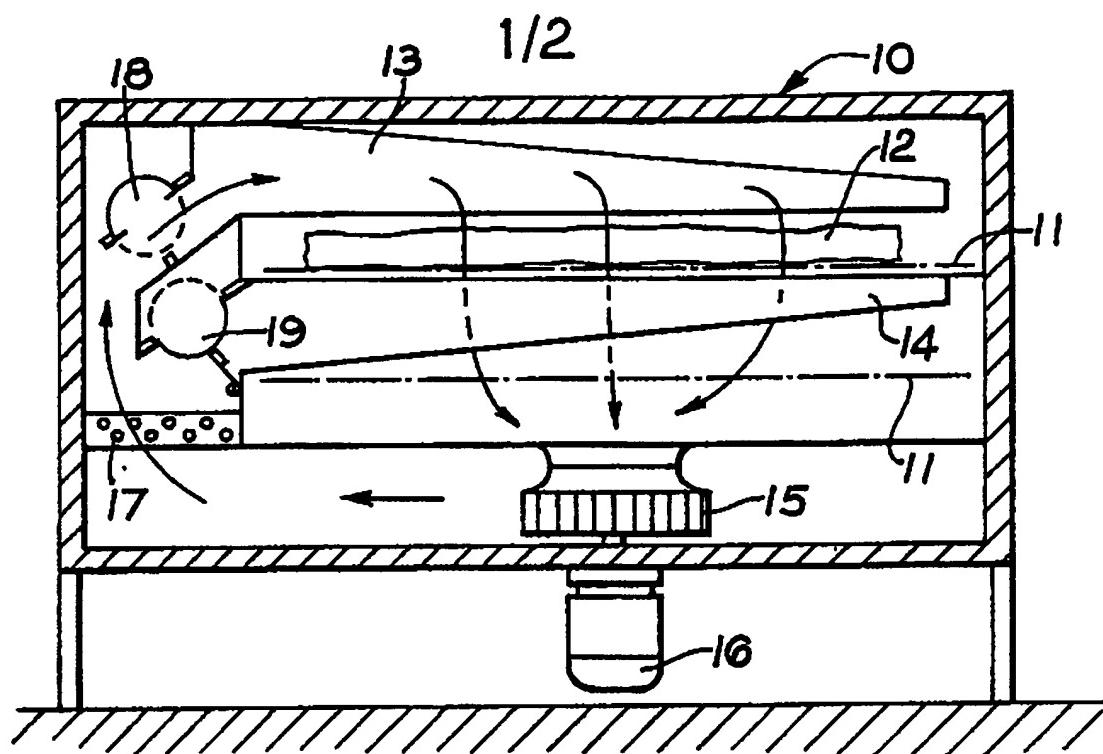


Fig. 1

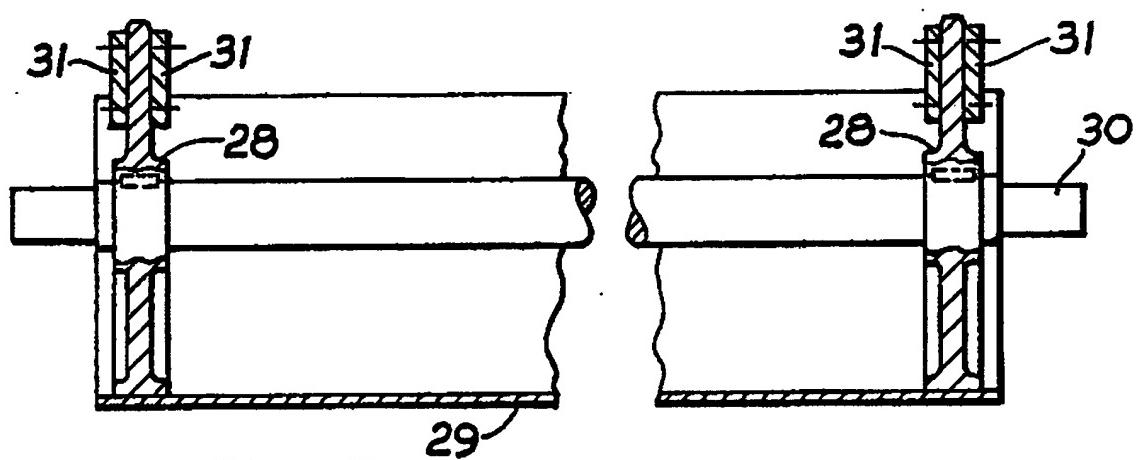


Fig. 3

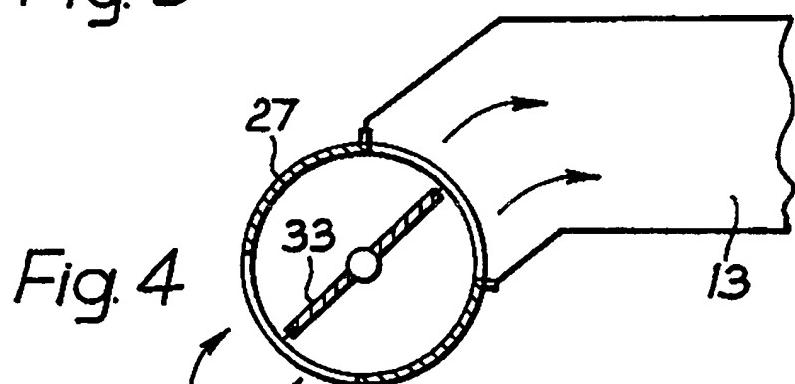


Fig. 4

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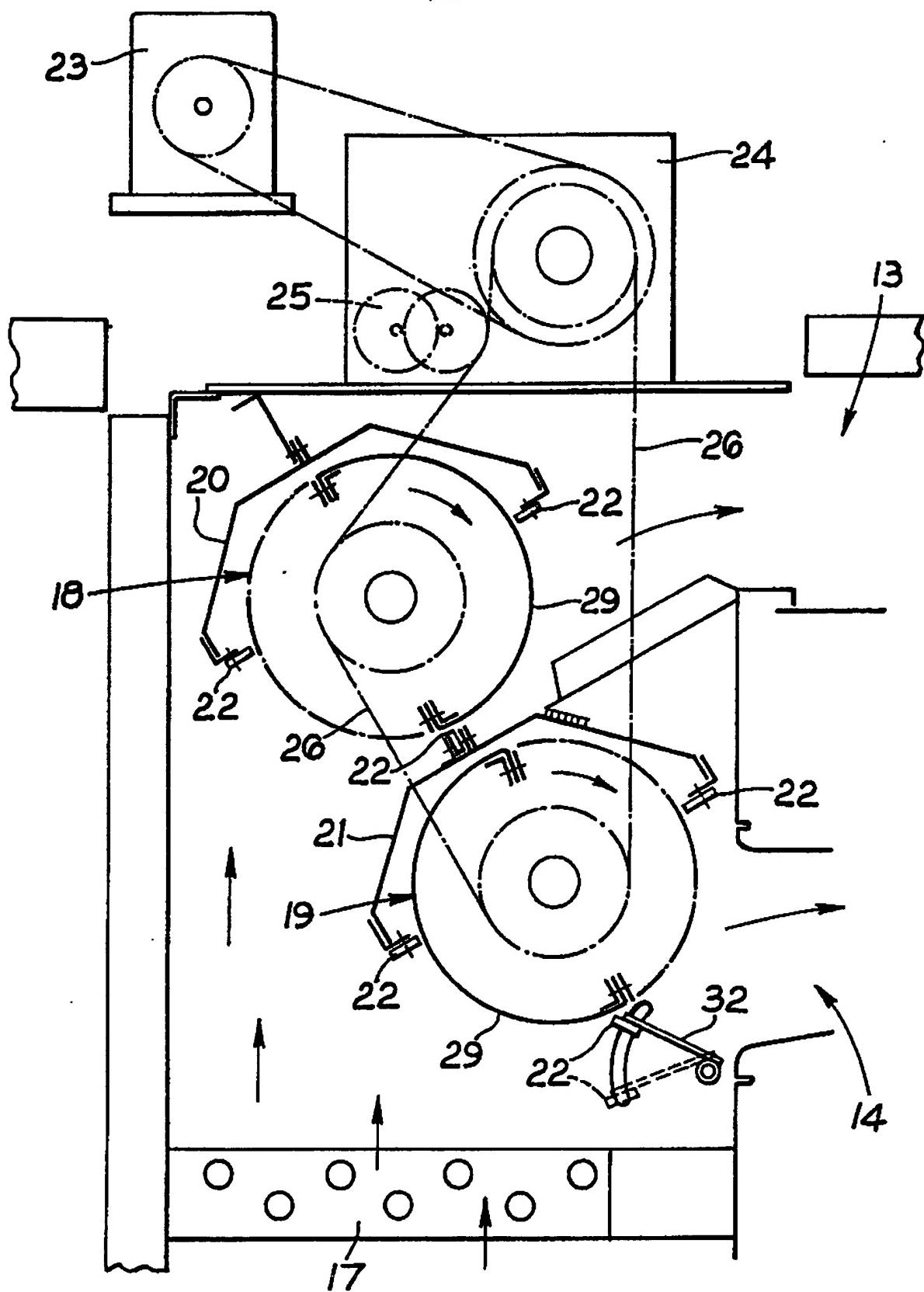


Fig. 2

SPECIFICATION

Apparatus for controlling the treatment agent during the heat treatment of travelling runs of cloth

- 5 The invention relates to apparatus for the continuous heat treatment, especially drying, of runs of cloth such as lengths of woven fabric, lengths of knitted fabric, lengths of bonded fabric and the like, which are liable to shrinkage during
- 10 the treatment and are placed with overfeed on to an endless wire cloth running through the drier and to which the treatment agent is supplied from above and below alternately through nozzles set in nozzle heads and provided above and below the
- 15 run of cloth.

In the case of known apparatus of this kind (DE—OS 2810178.2) a regulating flap is provided for regulating the supply of treatment agent to the nozzles. Practice has now shown that regulating flaps of that kind not only produce disturbing noises, but also generate oscillations with the risk of material breakages.

These deficiencies are to be eliminated by the present invention and one problem to be solved is

- 25 the ensurance of a quiet and undisturbed operation during the alternating supply and interruption of the supply of the treatment agent to the nozzles. Moreover, there is to be solved by the invention the further problem of intensifying
- 30 the intermittent supply of the treatment agent to the nozzles.

For the solving of these two problems it is proposed, in the case of an apparatus of the kind first described, to arrange in front of the admission

- 35 of the treatment agent into the nozzle heads, rotary slide valves producing opening and closing areas and through which alternately the passage of the treatment agent to the upper nozzle head and to the lower nozzle head is opened or shut off.
- 40 In a preferred specific embodiment of the invention the closing areas of the rotary slide valve are at the same time larger than the opening areas and partially overlap one another.

Apart from the fact that a rotary slide valve

- 45 operates more quietly than an oscillating flap and produces no oscillations, an increased thrust is built up for the treatment agent in front of the slide valves through the overlapping of the closing areas while radial blowing continues, this
- 50 increased thrust leading to a desirable intensified treatment agent momentum on to the run of cloth on opening of the slide valves.

In order to ensure this thrust build-up before the opening of the slide valves, packing strips

- 55 which are preferably adjustable should be provided between the stationary drier casing and the rotary slide-valves.

Chain drives by way of variable speed gearing, by means of which adaptation of the slide valve

- 60 revolutions to the cloth speed of travel is rendered possible, have proved to be appropriate for driving the rotary slide valves.

The rotary slide valves may comprise slide valve sectors secured on a spindle, a metal cover being

65 disposed at the periphery of the sectors and only partly masking the periphery, preferably over 190°. In order to eliminate imbalances on rotation of the slide valves, counter-weights should be secured to parts of the slide valve sectors not

- 70 masked by the metal cover.
- The invention will hereinafter be further explained with reference to the accompanying drawings, which are diagrammatic representations and in which:

- 75 Fig. 1 is the general view of a drier with rotary slide valves according to the invention;
- Fig. 2 shows the construction of the rotary slide valves on a larger scale;
- Fig. 3 is a longitudinal section through a rotary slide valve of one form of construction; and
- Fig. 4 shows another form of construction of rotary slide valve.

In a drier casing 10 of construction known *per se* and represented in Fig. 1, there are above and

- 85 below the run 12 of cloth, which is supported on a wire cloth 11 circulating through the treatment chamber, upper and lower nozzle heads 13 and 14, respectively, in which are the nozzles for blowing the treatment agent on to the run of cloth.

- 90 The nozzle heads 13, 14 and the nozzles may be formed in any manner known *per se*.

The treatment agent is directed across radiator 17 into the nozzle heads by a blower 15 with driving motor 16, passes from there through the

- 95 nozzles on to the run 12 of cloth, is carried away from there and finally again drawn in by the blower, whereupon the cycle is repeated.

Rotary slide valves 18 and 19, through which the treatment agent stream is delivered into the

- 100 upper and lower nozzle heads 13 and 14 alternately, can be discerned in front of the nozzle casings. The consequence of this is an intermittent lifting of the run 12 of cloth off from the wire cloth 11, whereby the run of cloth laid in loose folds on the wire cloth can shrink freely, so that at the end of the treatment it leaves the drier dried and shrunk in smooth length.

Fig. 2 discloses the mounting, the arrangement and the drive of the rotary slide valves 18 and 19, which are situated in front of the nozzle casings 13 and 14 in the treatment agent circulation indicated by arrows. The rotary slide valves 18, 19 consisting, as shown in Fig. 3, essentially of the

- 110 slide valve spindle 30, the slide valve sectors 28
- 115 and the metal covers mounted at the periphery of the sectors and only partially masking the periphery; are both closed in the attitude

represented, so that no treatment agent can enter into the nozzle heads 13 and 14. In this attitude of

- 120 the slide valves the blower builds up in front of the slide valves an increased thrust which, when the lower slide valve opens on further rotation of the slide valves, pushes the treatment agent into the nozzle head 14 with a considerable momentum

- 125 which is propagated up to the impact of the treatment agent from the nozzles on the run of cloth and lifts the latter, so that it is not only dried but can also shrink freely. There is a corresponding sequence of events when, on further rotation of

the slide valves and after closure of both slide valves, the upper rotary slide valve 18 opens. In order to keep the through-passage losses small, there are provided several packing strips 22 which 5 are attached to separate covering casings 20 and 21. Fig. 3 further discloses a separate metal deflector for better guidance of the treatment agent stream, as well as, at the lower rotary slide valve 10, a bottom vent flap 32 which is opened 10 when operations are to be carried out with drier control only apart from intermittent admission of air.

The drive of the rotary slide valves 18, 19 takes place in the exemplary embodiment illustrated by 15 way of a chain 26 from a chain gear box 24 in which a tensioning roller 25 for the chain is also located. The drive of the sprocket wheels is conducted through variable speed gearing 23, in order to enable the speed of rotation of the rotary 20 slide valves 18, 19 to be best adapted to the speed at which the run 12 of cloth passes through.

Instead of the specific rotary slide valve embodiment illustrated in Figs. 1 to 3, the rotary slide valve may be of any other construction with 25 features according to the invention. For example, as is indicated in Fig. 4, the rotary slide valves may also have a casing in the form of a double-slotted pipe 27 in which a flat slide valve 33 rotates.

CLAIMS

30 1. Apparatus for the continuous heat treatment, such as drying, of runs of cloth such as lengths of woven fabric, lengths of knitted fabric, lengths of bonded fabric and the like, which are liable to shrinkage during the treatment and are placed 35 with overfeed on to an endless wire cloth running through the drier and to which the treatment agent is supplied from above and below alternately through nozzles set in nozzle heads and provided above and below the run of cloth, 40 characterised in that rotary slide valves producing opening and closing areas are arranged in front of the admission of the treatment agent into the nozzle heads and through which alternately the

- passage of the treatment agent to the upper 45 nozzle head and to the lower nozzle is opened or shut off.
2. Apparatus according to claim 1, in which the closing areas of the rotary slide valves are greater than the opening areas and partially overlap one another.
 3. Apparatus according to claim 1 or 2, in which packing strips are provided between the stationary drier casing and the rotary slide valves.
 4. Apparatus according to claim 3, in which the 55 packing strips are adjustable.
 5. Apparatus according to any one of claims 1 to 4, in which the rotary slide valves are driven by means of a chain drive by way of variable speed gearing.
 - 60 6. Apparatus according to any one of claims 1 to 5, in which the rotary slide valves comprise slide valve sectors secured on a spindle, a metal cover being disposed at the periphery of the sectors and only partly masking the periphery.
 - 65 7. Apparatus according to claim 6, in which the metal cover masks the periphery of the rotary slide valves over more than about 180°.
 8. Apparatus according to claim 6 or 7, in which counter-weights are secured to parts of the 70 slide-valve sectors not masked by the metal cover.
 9. Apparatus according to any one of claims 1 to 5, in which the slide-valve casings are in the form of twice-slotted pipes in which flat slide valves revolve.
 - 75 10. Apparatus according to any one of claims 1 to 9, in which the attitude of each of the revolving slide valves is adjustable relative to the other for the supply of the treatment agent above and below the run of cloth.
 - 80 11. Apparatus for the continuous heat treatment of runs of cloth, substantially as hereinbefore described with reference to Figs. 1, 2 and 3 of the accompanying drawings.
 12. Apparatus for the continuous heat 85 treatment of runs of cloth, substantially as hereinbefore described with reference to Figs. 1, 2 and 4 of the accompanying drawings.